UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/826,974	04/15/2004	Jay Yogeshwar	3382-67648-01	1029

26119 7590 07/09/2008

KLARQUIST SPARKMAN LLP
121 S.W. SALMON STREET
SUITE 1600
PORTLAND, OR 97204

EXAMINER	
WERNER, DAVID N	
ART UNIT	**PAPER NUMBER**
2621	
MAIL DATE	**DELIVERY MODE**
07/09/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/826,974	YOGESHWAR ET AL.
	Examiner	Art Unit
	David N. Werner	2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 March 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *20080603, 20080619*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. This Office action for US Patent Application 10/826,974 is in response to communications filed 17 March 2008, in reply to the Non-Final Rejection of 13 September 2007. Currently, claims 1-56 are pending.

2. In the previous Office action, claims 11, 20, 29, 39, 52, and 56 were rejected under 35 U.S.C. 101 as non-statutory. Claims 1, 2, 8, and 11-15 were rejected under 35 U.S.C. 102(b) as anticipated by "Transcoding of MPEG Bitstreams" (Keesman et al.). Claims 17 and 20-23 were rejected under 35 U.S.C. 102(b) as anticipated by US Patent 6,466,623 B1 (Youn et al.). Claims 38, 41, 42, and 53 were rejected under 35 U.S.C. 102(b) as anticipated by "Transcoding of Single-Layer MPEG Video into Lower Rates" (Assunção et al. 1997). Claims 3 and 7 were rejected under 35 U.S.C. 103(a) as obvious over Keesman et al. in view of Youn et al. Claims 6, 9, 10, 16, and 24-29 were rejected under 35 U.S.C. 103(a) as obvious over Keesman et al. in view of an alleged public use of the invention prior to one year to the priority filing date of the present invention. Claims 4 and 5 were rejected under 35 U.S.C. 103(a) as obvious over Keesman et al. in view of Youn et al. and the alleged public use. Claims 18 and 19 were rejected under 35 U.S.C. 103(a) as obvious over Youn et al. in view of the alleged public use. Claims 39 and 56 were rejected under 35 U.S.C. 103(a) as obvious over Assunção et al. 1997. Claims 30-33, 35-37, 43, 44, and 46-52 were rejected under 35 U.S.C. 103(a) as obvious over Assunção et al. 1997 in view of the alleged public use. Claims 34 and 45 were rejected under 35 U.S.C. 103(a) as obvious over Assunção et

al. 1997 in view of the alleged public use, and in view of US Patent 6,084,909 A (Chiang et al.). Claims 54 and 55 were rejected under 35 U.S.C. 103(a) as obvious over Assunção et al. 1997 in view of "Buffer Analysis and Control in CBR Transcoding" (Assunção et al. 2000).

Information Disclosure Statement

3. The information disclosure statement filed 03 June 2008 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because it does not provide a complete publication date, including month and year, of the non-patent literature documents cited therein. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

Response to Amendment

4. The declaration under 37 CFR 1.132 filed 17 March 2008 is sufficient to overcome the rejection of claims 4-6, 9, 10, 16, 18, 19, 24-37, and 43-52 based upon an alleged public use of the invention more than one year prior to the filing date of the present application. The reference "Microsoft Debuts New Windows Media Player 9

series", previously used as evidence of the public use, **remains a valid reference on its own for claim 16**, which specifically mentions encoding video in the Windows Media Video 9 format.

Response to Arguments

5. Applicant's arguments, see pages 12-21, filed 17 March 2008, with respect to the rejection(s) of claim(s) 1-56 under Keesman, Youn, and Assunção, have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. Applicant argues that the Keesman, Youn, and Assunção references, used as the sole or primary references in the rejection of the independent claims, do not teach the claimed limitation of performing a transcoding operation in which the source format is different than the target format. However, upon further consideration, a new ground(s) of rejection is made in view of US Patent 6,647,061 B1 (Panusopone et al.).

Claim Rejections - 35 USC § 101

Claims 11, 20, 29, 32, 39, 52, and 56 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The relevant portions of the USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility (Official Gazette Notice of 22 November 2005), Annex IV, read as follows:

> In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See *Lowry*, 32 F.3d at 2583-84, 32 USPQ2d at 1035.

> Claims that recited nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, *per se*, and as such are nonstatutory natural phenomena. See *O'Reilly*, 56 U.S. (15 How.) at 112-114. Moreover, it does not appear that a claim reciting a signal encoded with functional descriptive material falls within any of the categories of patentable subject matter set forth in Sec. 101.
>
> …a signal does not fall within one of the four statutory classes of Sec. 101.
>
> …signal claims are ineligible for patent protection because they do not fall within any of the four statutory classes of Sec. 101.

Claims 11, 20, 29, 32, 39, 52, and 56 are drawn to a "storage medium" encoding functional descriptive material. Normally, the claims would be statutory. However, the specification, at page 10: lines 16-19, defines the claimed storage medium as encompassing statutory material such as "magnetic disks" and "CD-ROMs", as well as "**any other medium**", which encompasses both the statutory media described within the paragraph, as well as non-statutory signal or carrier wave media such as the "communication" medium described in page 10: line 28–page 11: line 3.

A signal embodying functional descriptive material is neither a process nor a product (i.e., a tangible "thing") and therefore does not fall within one of the statutory classes of §101. Rather, a "signal" is a form of energy, in the absence of any physical structure or tangible material. See *In re Nuijten*, 84 USPQ2d 1495 (Fed. Cir. 2007, *en banc* denied 2008, *writ of cert. pending*). Because the full scope of the claims as properly read in light of the disclosure encompasses non-statutory subject matter, the claims as a whole are non-statutory.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-3, 7, 8, 10-15, 17, 18, 20-30, 32, 33, 35-43, 47, 48, 50-53, and 56 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by US Patent 6,647,061 B1 (Panusopone et al.). Panusopone et al. teaches a transcoder that converts an MPEG-2 bitstream to an MPEG-4 bitstream, which was known in the art at the time of the invention to produce similar quality video at a lower bitrate. Regarding **independent claims 1 and 17**, figure 4 illustrates one embodiment of the transcoder of Panusopone et al., in which B frames are enabled, and figure 3 illustrates an additional embodiment in which B frames are disabled in the output bitstream. Both transcoders share a number of components and functionalities (column 7: lines 10-23). In Panusopone et al., header decoding function 304 decodes MPEG-2 headers and produces a look-up table to re-build MPEG-4 headers (column 6: lines 48-51). This corresponds with the claimed step of obtaining type values. The transcoder also provides for a series of MPEG-2 decoding steps, such as variable length decoding, inverse scan, inverse quantization, and inverse DCT (figure 4A). This corresponds with the claimed step of decompressing the compressed video in the source format. The transcoder additionally

performs MPEG-4 encoding steps such as DCT, Quantization, AC/DC prediction, Scan/Run-Length Coding, and Variable-Length Coding (Figure 4B). This corresponds with the claimed step of re-compressing video in a target format. As can be shown in the tables, many of the headers in the target MPEG-4 bitstream are either directly derived from, or the same as, the headers in the source MPEG-2 bitstream (column 8: lines 37-54). The MPEG-2 headers correspond with the claimed "plural source format syntax elements". "Generally, the same coding mode which is used in MPEG-2 coding should be maintained. This mode is likely to be the optimum in MPEG-4 and hence avoids the complexity of the mode decision process" (column 8: lines 23-27). This corresponds with the claimed step of making coding decisions during recompression to match quality based on obtained type values. The actual recompression steps of MPEG-4 are done independently from decoded data (column 7: lines 45-67). This corresponds with the claimed step of making independent coding decisions in recompressing video to take advantage of the target format.

Regarding **independent claim 24**, in Panusopone et al., the field or frame coding mode is maintained during transcoding (column 15: lines 6-7).

Regarding **independent claims 30, 38, and 43**, although MPEG-4 uses a different quantization scheme than MPEG-2, the MPEG-4 quantization in the transcoder of Panusopone et al. is derived directly from the MPEG-2 quantization (column 13: lines 44-54; column 14: lines 44-54).

Regarding **independent claim 53**, Panusopone et al. controls the bitrate of transcoded MPEG-4 audio by controlling the quantization level of the re-constructed macroblocks according to MPEG-2 guidelines (column 13: line 44–column 14: line 54).

Regarding **claim 2**, as shown in figure 4A, header decoding 304 is processed on the MPEG-2 input bitstream before the first decoding step 405.

Regarding **claim 3**, in Panusopone et al., motion compensation function 440 operates from the re-encoded, quantized DCT values from the coder (column 7: lines 61-67) and scaled MVs from the MV decoder 425 (figure 4A).

Regarding **claims 7 and 50**, in Panusopone et al., although motion vector mode is generally maintained, with the notable exception of converting intra-mode B macroblocks with direct mode B macroblocks (column 14: line 64–column 15: line 63), if an advanced prediction mode is used, the predictor value in the MPEG-4 target bitstream is independently derived (column 14: lines 64-65).

Regarding **claim 8**, in Panusopone et al., the MPEG-2 bitstream is completely decoded to pixel data (column 10: lines 37-39).

Regarding **claims 10 and 51**, MPEG-4 was known to use a more efficient variable length coding system than MPEG-2. The target bit stream is encoded with this efficient coding (column 13: lines 62-67).

Regarding **claims 11, 20, 29, 32, 39, 52, and 56**, Panusopone et al. may be implemented on a "desktop PC or workstation" (column 2: lines 62-63).

Regarding **claims 12 and 21**, MPEG-2 operates on pictures and MPEG-4 operates on Video Object Planes (VOPs) (column 8: line 64), with the VOP restricted in Panusopone et al. to correspond exactly with the MPEG-2 pictures (column 8: lines 18-33), with the VOP types being I-VOP, P-VOP, and B-VOP (column 14: line 37). Regarding **claims 22 and 23**, preserving picture type inherently preserves picture order and the structure of an MPEG-4 Video Object Layer (VOL), the equivalent to a Group of Pictures (GOP).

Regarding **claims 13 and 27**, Panusopone et al. takes advantage of the improved entropy coding of MPEG-4 (column 13: lines 62-67) to achieve greater compression for substanitally every frame.

Regarding **claim 14**, Table 5 of Panusopone et al. shows that nearly all macroblock headers in the MPEG-4 target stream are derived from the macroblock headers in the MPEG-2 source stream (column 11).

Regarding **claim 15**, in Panusopone et al., macroblock coding type is preserved (column 7: lines 32-40), except intra macroblocks in B pictures are converted to direct mode macroblocks (column 15: lines 42-63), and regarding **claims 18 and 48**, when this occurs, the number of motion vectors per macroblock changes.

Regarding **claim 25**, in Panusopone et al., the field or frame MV coding is set at the macroblock layer (column 13: lines 25-27), and regarding **claim 26**, interlacing is set at the VOL layer, with top or bottom field first set at the VOP layer (Table 3).

Regarding **claim 28**, the introduction of direct mode MBs to replace inter MBs in B-VOPs (column 15: lines 49-63) is stated to improve coding efficiency (column 5: line 60–column 6: line 8).

Regarding **claim 33**, table 5 shows MPEG-4 quantization to be at the macroblock level.

Regarding **claim 35**, in Panusopone et al., MPEG-2 QP directly determines the dquant value in the MPEG-4 stream (column 13: lines 49-54), shown in Table 5 to be at the macroblock level.

Regarding **claims 36 and 42**, Panusopone et al. restricts quantization fluctuations according to MPEG-2 rate control, and regarding **claims 37 and 47**, the setting of the MPEG-4 quantization according to this rate control is designed to minimize the re-quantization loss from the MPEG-2 quantization (column 14: lines 44-54) and to reduce drift, or a difference between the original frame and reconstructed frame (column 13: lines 46-48).

Regarding **claims 40 and 41**, quantization levels in both MPEG-2 and MPEG-4 are differential quantization step sizes presented at the macroblock layer (column 13: lines 49-54).

Regarding **claim 45**, Panusopone et al. controls quantization fluctuation at the macroblock level (column 14: lines 44-46).

Claim Rejections - 35 USC § 103

8. Claims 5, 6, 9, 19, 31, 46, and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Panusopone et al. in view of "H.264 – A New Technology for Video Compression" (Nuntius). Nuntius describes the H.264 video coding standard, especially in comparison with MPEG-2 and MPEG-4.

Regarding **claim 5**, table 1 of Nuntius shows that H.264 uses 1/4 pixel motion estimation rather than ½ pixel motion estimation. Regarding **claims 6, 9, 19, 31, and 49**, Table 1 also shows that H.264 uses a 4 x 4 Integer Transform rather than 8 x 8 Discrete Cosine Transform. In a transcoder from MPEG-2 to H.264, the transform process would be re-encoded similar to the quantization re-encoding of Panusopone. Regarding claim 46, Nuntius states that H.264 produces an improvement in compression efficiency of about 2X over MPEG-4, which is slightly more efficient than MPEG-2 (pg. 1).

Panusopone et al. discloses the present invention except Panusopone et al. transcodes from MPEG-2 to MPEG-4. Nuntius teaches that H.264 coding was known at the time of the invention. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the transcoder of Panusopone et al. to produce H.264 video, as taught by Nuntius, since Nuntius states in page 1 that such a modification would yield a video bitstream with twice the compression ratio for similar quality as MPEG-4 video.

9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Panusopone et al. in view of Nuntius, and in view of "Intensity Controlled Motion Compensation" (Kari et al.). Claim 4 is directed to encoding video with loop filtering and intensity compensation. Nuntius demonstrates that H.264 coding included a deblocking filter (Table 1), known to be typically implemented as a loop filter, but is silent on intensity compensation.

Kari et al. teaches a motion compensation model. Regarding **claim 4**, in Kari et al., a block may have multiple motion vectors, depending on different pixel intensities within a block (pg. 2). A block is fractionated into different intensity intervals, with each having its own motion vector. This corresponds with the claimed "intensity compensation".

Panusopone et al., in combination with Nuntius, discloses the claimed invention except for performing intensity compensation. Kari et al. teaches that it was known to perform intensity-based compensation. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the motion compensation system of Kari et al. into the transcoder of Panusopone et al., since Kari et al. states in pages 6-7 that such a modification would produce less prediction error than standard motion compensation techniques.

10. **Claim 16** is rejected under 35 U.S.C. 103(a) as being unpatentable over Panusopone et al. in view of "Microsoft Debuts New Windows Media Player 9 series"

(WMV Press Release). The WMV Press Release describes the WMV 9 video compression standard.

Panusopone et al. discloses the present invention except Panusopone et al. transcodes from MPEG-2 to MPEG-4. The Press Release teaches that WMV 9 coding was known at the time of the invention. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the transcoder of Panusopone et al. to produce WMV 9 video, as taught by the Press Release, since the Press Release states in page 1 that such a modification would yield a video bitstream with treble the compression ratio for similar quality as MPEG-2 video.

11. Claims 34, 44, 54, and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Panusopone et al. in view of "Overview of MPEG-2 Test Model 5" (TM5). Test Model 5 is the main rate control model for MPEG-2. Since Panusopone et al. operates according to MPEG-2 rate control (column 14: lines 45-46), Test Model 5 is assumed to be incorporated into Panusopone et al. Regarding **Claims 34 and 44**, TM5 operates on a "global complexity measure" for a picture type, based on an "average quantization parameter computed by averaging the actual quantization values used during the encoding of all the macroblocks" in a frame of its type (pg. 6). Regarding **claim 54**, TM5 performs rate control "by means of a 'virtual buffer'" (pg. 6), with a quantization parameter set on its fullness (pp. 9-11). Regarding **claim 55**, the buffer fullness is calculated according to a difference between an initial buffer fullness and

actual number of bits needed to encode a picture with the target number of bits (pp. 9-10).

Panusopone et al. discloses the claimed invention except for details of rate control. TM5 teaches the MPEG-2 Rate Control system in detail. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate Test Model 5 into the transcoder of Panusopone et al., since TM5 states in page 1 that this is the preferred method of rate control in MPEG-2.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent 6,490,320 B1 (Vetro et al.) teaches a transcoder that changes output formats based on network constraints on the output stream. US Patent 6,526,099 B1 (Christopoulos et al.) teaches a transcoder that scales motion vectors from the decoder to an encoder that produces video at a different resolution. US Patent 6,931,064 B2 (Mori et al.) teaches an MPEG-2 to MPEG-4 transcoder. US Patent 6,961,377 B2 (Kingsley) teaches a transcoder that uses sub-transcoders for different frame types. US Patent 7,039,116 B1 (Zhang et al.) teaches a transcoder that modifies an output stream based on the capabilities of a final decoder. US Patent 7,142,601 B2 (Kong et al.) teaches a transcoder that optimizes motion compensation modes for the reconstructed macroblocks. US Patent Application Publication 2002/0080877 A1 (Lu et al.) teaches a transcoder that uses an estimator to optimize compression of a re-encoded video. US Patent Application 2002/0172154 A1 (Uchiha et al.) and US Patent

Application Publication 2003/0206597 A1 (Kolarov et al.) teach heterogeneous video transcoders. US Patent Application Publication 2003/022974 A1 (Nakamura et al.) teaches an MPEG-2 to MPEG-4 transcoder.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David N. Werner whose telephone number is (571)272-9662. The examiner can normally be reached on Monday-Friday from 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. N. W./

Examiner, Art Unit 2621

/Mehrdad Dastouri/
Supervisory Patent Examiner, Art Unit 2621